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The cost of cash and debit cards in Austria

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ABSTRACT

This paper aims to close a gap in the literature on the cost of payment systems by analyzing the cost of cash and debit cards in Austria. No prior analysis exists, as far as the authors are aware. Using novel data from several sources, the unit costs for cash and debit card payments in 2013 are estimated to be €0.40 and €0.39, respectively, which are close to the most cost-efficient countries in Europe (the Netherlands and Scandinavian countries). Although Austrian consumers have a much stronger preference for cash than consumers in these countries, the Austrian payment industry appears to have developed relatively cost-efficient institutional structures by relying upon centralization and international outsourcing. However, cost efficiency could be further increased by increasing the share of debit card payments or other cost-efficient digital payment methods.

Keywords: cost of cash; debit cards; cash substitution; payment system efficiency; payment behavior.

1 INTRODUCTION

In recent years, rising interest in the use of different payment technologies has led to an increasing number of studies on the cost of the payment system (see Gresvik

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and Haare 2009; Segendorf and Jansson 2012; Schmiedel *et al* 2012; Bolt 2012; OECD 2012; Krüger and Seitz 2015; Koivuniemi and Kemppainen 2007). Building upon a better understanding of cost structures, policy initiatives have been undertaken in many countries to reduce transaction costs, thus realizing the potential for cost savings created by the digital transformation of the payments industry (see Bolt and Chakravorti 2010; Jonker 2013; Jonker *et al* 2015). Also, long-standing debates about regulatory issues such as interchange fees can be put on a firmer empirical footing by increasing the transparency of cost. The existing literature provides many interesting insights about cost structures, but also reflects the substantial analytical challenges faced by researchers as cost information is often not readily available and the theoretical foundations of cost studies are still under development.

This paper examines the case of Austria. It contributes to the existing literature by

(1) providing the first study on the cost of cash and debit cards in Austria, thus shedding light on cost structures in a high-income country with a high share of cash transactions,

(2) introducing a new robust method for deriving the threshold amount at which debit card payments are more cost efficient than cash payments,

(3) using a novel data set on cash and card transactions to better gauge the actual potential for cash substitution.

Austria is an interesting case for international comparisons because, despite its high level of income, cash is still by far the most popular payment instrument at the point of sale (see OeNB 2010; Mooslechner *et al* 2012).[1] As the physical handling of cash induces substantial costs, there is constant pressure on agents along the payment chain to trim the cost of cash. On the other hand, the relatively small size of the Maestro debit card system, which is the most important alternative to cash at the point of sale in Austria, poses challenges in reaping economies of scale.[2] Weighing traditional payment patterns against cost pressures, it is not clear whether Austria lags behind other European countries in cost efficiency or whether it has developed efficient structures to stem the cost of retail payments. Our study shows that the cost of both cash and debit cards appears to be relatively close to that in the most cost-efficient European countries (see Section 3.1).[3]

[1] For the similarity to Germany see Deutsche Bundesbank (2015).

[2] According to ECB payments statistics, the number of credit card transactions was about one-tenth of the number of debit card transactions in Austria in 2013.

[3] The most notable international study conducted in recent years is the ECB study (see Schmiedel *et al* 2013) on the cost of retail payments in the European Union, which includes thirteen countries that are evaluated on a unified basis for the first time. This study estimated the total cost of retail payments to society to be 1% of GDP in 2009. Austria did not participate in this study.

Due to the limited availability of data, cost studies typically rely upon a number of approximations and simplifications. Hence, the robustness of the results becomes a critical issue. Robustness particularly matters for policy conclusions such as the derivation of the efficiency threshold, ie, the amount above which debit card payments are more cost efficient than cash payments. In Section 4.1 an efficiency threshold of about €10 is derived by applying a new, more robust methodology as developed in Abele and Schaefer (2015). However, this amount provides little information about the actual potential for cash substitution, as payment habits severely limit substitution. To obtain a better assessment of substitution, our study draws upon data including both automated teller machine (ATM) cash withdrawals and debit card payments (see Section 4.2). It is suggested that, in the medium term, substitution is likely to remain concentrated in a segment covering 30–40% of the total population unless stronger incentive schemes are created.

The analysis builds upon a comprehensive database, combining public information with lots of other data that was specifically collected for the purpose of this study. The Austrian National Bank (Österreichische NationalBank (OeNB)), all major Austrian commercial banks and debit card firms supplied proprietary data. A consumer survey conducted by a market research firm and an extensive sample of data on consumer payments at the point of sale collected for this study provided information about households (see GfK 2015). As in many other studies, the firms' back-office costs turned out to be hardest to quantify. Here our study had to rely partly upon external sources.

2 METHODOLOGY AND DATA

To assess the cost of the payment system, the total amount of resources consumed in the payment process has to be estimated, and personnel, equipment, information technology (IT) costs and other related costs must be included. The various costs arise in different sectors in the economy. Typically, the central bank, commercial banks, infrastructure companies, private companies and consumers should be distinguished. This study builds upon these basic cost concepts and uses the classification of sectors that has been established in the literature.

Costs as total resource consumption are to be distinguished from the costs faced by participants along the payments chain (some authors use the term "social cost" for total resource use). In particular, payments between sectors are an expense from the payers' perspective. However, such payments are not considered as costs to the economy because resources are only transferred between sectors and not consumed. Hence, items such as seigniorage or fees paid between sectors do not enter into the calculations of the cost of the payment system.

The question of whether the consumer sector should be included in the cost estimates is somewhat controversial. Most studies do not consider costs to consumers even though, in total, consumers spend a substantial amount of time making payments, which may be seen as an input of resources. Hence, it is sometimes argued that an average wage rate should be applied to value consumers' time (see Segendorf and Jansson 2012). On the other hand, the opportunity cost of time spent by consumers in making a payment is likely to be low. Seldom will a consumer produce more output if the time required for making a payment is reduced by a few seconds. Thus, the opportunity cost of making a payment in terms of lost output is low. By the latter argument and for comparability we follow the majority of cost studies and do not include the cost incurred in the consumer sector. Consumer behavior will play an important role, however, when the potential for cash substitution is considered in Section 4.2.

Whereas all cost studies basically distinguish similar sets of sectors and consider comparable concepts of the total resource cost of the payment system, the more detailed breakdowns of cost structures differ quite substantially. This is partly due to differences in payment systems, and partly because different cost accounting frameworks are used. For example, some researchers applied activity-based cost accounting, thus posing detailed questions about many different cost items related to the various activities in the payment process. However, a significant share of respondents are typically not willing or able to provide such information. Hence, there exists a fundamental trade-off between high data demands and the rejection rates of respondents.

As this study is, to the best of our knowledge, the first cost study conducted in Austria, rejection rates were a matter of concern, and hence data demands were kept moderate. However, a critical data requirement was the clear identification of fixed costs, costs related to the number of transactions and costs related to transaction amounts. Our focus was on the identification of the total cost of domestic payments in 2013. Generally, data was collected in the form available to respondents, thus taking a calculated risk that some definitions or accounting practices might be heterogeneous. All data was cross-checked, and a small number of apparent outliers were scrutinized in a second round of data inquiries until a more homogeneous database was obtained. Table 1 shows in more detail which sectors and cost items were considered.

3 THE COST OF CASH AND DEBIT CARDS IN AUSTRIA

3.1 The level and structure of costs

By fitting the Austrian data to the cost framework in Table 1, we obtain the cost of cash and debit cards in 2013 as shown in Table 2. The total cost of cash to the Austrian economy amounted to approximately €1.2 billion, ie, 0.36% of GDP. The total cost of debit cards was about €150 million, ie, 0.05% of GDP.

TABLE 1 A cost framework for cash and debit cards.

(a) Cost of cash	
Central bank (including the relevant units in the Austrian National Bank, the cash operations of the Austrian mint and central banking related costs of Cash Service Austria)	• Production, distribution, servicing of cash • Overheads
Banks and infrastructure (including commercial banks, cash related activities of Payment Services Austria and bank-related activities of Cash Service Austria)	• Personnel, other costs in bank branches • Cash system maintenance and operation (IT costs, hardware, etc) • ATM infrastructure cost • Overheads • Other cost
Nonfinancial companies	• Front-office costs • Back-office and other costs
(b) Cost of debit cards	
Banks and infrastructure (including commercial banks, debit card related activities of Payment Services Austria and acquiring firms)	• Cost of central system infrastructure • Debit card system maintenance and operation (IT costs, hardware, etc) incurred by commercial banks • Acquiring cost
Nonfinancial companies	• Front-office costs • Back-office and other costs

When interpreting these cost numbers, we have to take into consideration that the number of transactions was much smaller for debit cards than for cash, and hence the total cost for debit cards was expected to be lower. We can account for this difference by looking at unit costs, ie, the average cost per transaction. As shown in Table 3, the unit cost of a cash transaction was €0.40 and the unit cost of a debit card transaction was €0.39. However, a direct comparison of unit costs between different payment instruments is of limited use, as the average transaction amount for a debit card payment was much higher than for a cash payment. More sophisticated analyses of cost structures are necessary to assess relative cost efficiency. Such an analysis will be conducted in Section 3.2.

TABLE 2 The cost of cash and debit cards to the Austrian economy in 2013.

(a) Cash

	Cost to the economy (€)	Percentage of total cost	Percentage of GDP
Central bank	40 800 000	3.50	0.01
Commercial banks and infrastructure	564 700 000	48.41	0.18
Nonfinancial companies	561 100 000	48.10	0.17
Total	1 166 600 000	100.00	0.36

(b) Debit cards

	Cost to the economy (€)	Percentage of total cost	Percentage of GDP
Acquirers and central infrastructure	40 300 000	27.12	0.01
Commercial banks	71 900 000	48.38	0.02
Nonfinancial companies	36 400 000	24.50	0.01
Total	148 600 000	100.00	0.05

TABLE 3 Comparison by country of the unit cost of cash and debit transactions.

	Unit cost		Transaction volume	
Country (year)	Cash (€)	Debit (€)	Cash (%)	Debit (%)
Denmark (2009)	0.78	0.36	45.8	54.2
Finland (2009)	0.28	0.22	57.2	42.8
Netherlands (2009)	0.39	0.33	69.8	30.2
European Central Bank (2009)	0.39	0.45	85.9	14.1
Austria (2013)	0.40	0.39	88.5	11.5

Transaction volume = cash + debit. *Source:* Schmiedel *et al* (2012, Tables 4 and 12) and authors' own calculations.

About half of the cost of cash to the economy arose in the banking sector. The other half originated with nonfinancial firms. As is typically the case, the central bank's share of the total costs was low. As for debit cards, half of the costs arose in the banking sector. Another quarter of total costs was generated by nonfinancial firms and by acquirers and central infrastructure, respectively.

International comparisons of cost are helpful for assessing the results on the cost of cash and debit card payments in Austria. Several national cost studies were conducted

TABLE 4 The average duration of payments.

Payment type	Average duration (s)
Cash €0–10	13.2
Cash €10.01–30	18.0
Cash >€30	24.2
Debit card	22.7

in preparation of the European Central Bank (ECB) study, so recent cost estimates were available for a number of countries. The unit costs of payments are a useful measure for international comparisons. Table 3 provides an overview of recent estimates of unit costs.

As for debit cards, pioneer countries in electronic retail payments, eg, Finland, Denmark and the Netherlands, had lower unit costs than Austria even though the Austrian numbers refer to a later year. This difference may be due to the smaller size of the Austrian debit card network. However, the unit cost of Austrian debit cards was smaller than the average of the countries included in the ECB study.

For cash, the cost pattern is less clear. Among the countries shown in Table 3, the country most suitable for comparison with Austria is the Netherlands, which also shares the euro and was a member of the hard currency Deutschmark block before the creation of the eurozone. The unit cost of cash was similar in both countries.

Summing up the international evidence, Austria does not seem to lag far behind some of the most advanced European countries in terms of unit costs. When considering cost as a percentage of GDP, Austria would look even more efficient because absolute cost levels are comparable while Austrian incomes tend to be higher. With a combined value of 0.41% of GDP for the sum of the cost of cash and debit cards, Austria would clearly belong to the group of low-cost countries in Europe. However, cost of payments as a percentage of GDP is a fuzzier indicator of cost efficiency.

3.2 Indirectly obtained cost items

Some of the cost items entering the calculations could not be obtained directly from the available data. As far as banking data was concerned, the banks in the sample covered about 90% of bank branches in Austria. The remaining 10% were obtained by assuming the same average cost per branch. Similarly, the information on cost provided by the biggest Austrian acquiring firm was extrapolated to all debit card transactions in Austria.

The cost arising at nonfinancial companies required complex approximations, as direct cost information was not available. The total cost for companies equals the sum of front-office and back-office costs. The front-office cost of both cash and

debit cards was based upon a sample of the duration of payment transactions at the cash register, including 350 observations made in about eighty different Viennese retail shops. The duration of a cash payment was defined as the time between the announcement of the amount due and the return of the change or the closing of the cash register depending upon which of the two occurred later. In the case of debit cards the return of the receipt marked the end of the payment process. For cash, three different estimates are reported (see Table 4), depending upon the transaction amount, as transactions with higher value typically take more time. The average duration of a cash payment, weighted by the shares of transaction volumes in total transactions, was about 15.75 seconds. Based upon information about total transaction volumes as described in the online appendix, and data published by the Austrian Statistical Office about wage rates in retailing, the total front-office cost of companies was derived as the total wage costs at the cash register.[4]

As already discussed in Section 1, no direct information was available for the back-office costs of nonfinancial companies. We therefore used the information provided in Schmiedel *et al* (2012), showing that in Europe on average front-office costs were 32% of the total cost of private companies. Based upon this value, we calculated the back-office costs of cash by assuming the same ratio of front-office to back-office costs. In contrast, the back-office cost for debit cards was derived from a study published by the European Commission on the merchant indifference test (European Commission 2014).[5] In this study, covering 253 European companies (fifteen of which were Austrian), the back-office cost was about 8.57% of the front-office cost. This value was the basis for calculating the back-office costs of debit cards.

Just as for most other studies on the cost of the payment system, the results for Austria are based upon a combination of direct cost information and indirect approximations. Although we acknowledge the limitations of the data available, the calculations should still provide useful information about the cost of the payment system.

[4] The hourly wage rate used for the calculations equaled €14.05. In 2013 the total number of cash transactions was about 2.9 billion, and the total number of debit card transactions was 378 million. Multiplying the average duration of a transaction by the number of transactions yields the total transaction time, which gets then multiplied by the average wage rate to obtain total wage costs at the cash register.

[5] The ECB study could not be used to calculate the back-office cost of debit cards as "private costs" could not be isolated from "social costs".

4 COST-EFFICIENT PAYMENTS AND THE SUBSTITUTION OF CASH BY DEBIT CARDS

4.1 The efficiency threshold for cash and debit card payments at the point of sale

Cash and debit card systems exhibit fundamentally different cost structures. The cost of a cash transaction rises with the transaction amount as more physical handling is required. The cost of a debit card transaction is basically flat because the payment is transmitted in digital form. Due to these differences, cash is typically cheaper for low-value payments and debit cards are cheaper for higher value payments.[6] The efficiency threshold defines the transaction amount below which cash is cheaper and above which debit cards are more cost efficient.

Fully specified cost functions are typically unavailable for the analysis of efficiency thresholds. However, we can develop a simple linear cost framework in order to derive an approximation of the threshold. To do this we have to split up the total costs into fixed costs, costs related to the volume of transactions and costs related to the value of transactions. Then we can proceed as follows to identify the efficiency threshold:

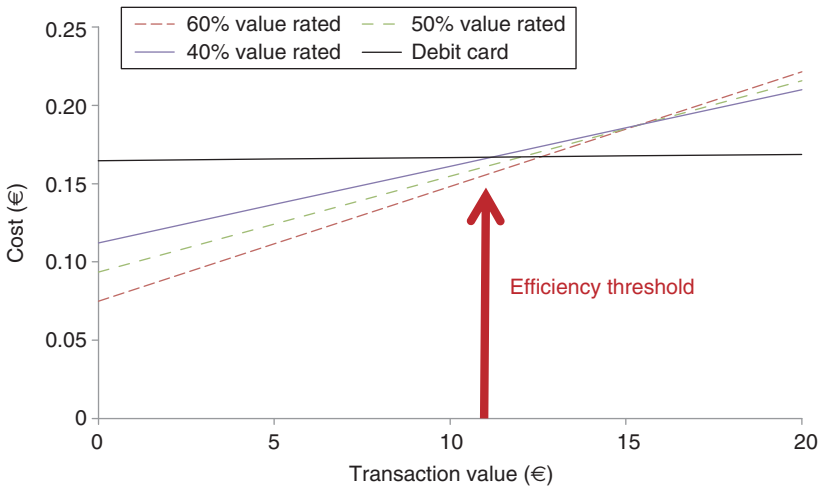
- as a marginal perspective focusing on the cost of an additional payment is adopted, fixed costs can be ignored;
- the intercept of the linear cost schedule representing the cost of one additional transaction can be approximated by dividing the total cost related to the number of transactions by the total number of transactions;
- the slope of the cost schedule can be approximated by dividing the total cost related to the value of transactions by the total transaction amount.

The procedure can be followed for both cash and debit cards, thus yielding the cost schedules for the two payment instruments. As will be seen below, the efficiency threshold lies at the intersection of the two cost schedules.

Truly fixed costs are often easy to identify, as they do not vary with payment volumes. Overheads or infrastructure costs are a good example. For debit cards, costs are practically independent of the transaction amount, so it is straightforward to derive the cost schedule for an additional transaction. In the case of cash, however, the splitting of costs between volume- and value-related components cannot be performed exactly. Take, for example, front-office costs at a shop or at a bank office. Part of the time a cashier spends on the transaction process is independent of the amount paid, eg, the opening or closing of the cash register. Counting cash, however, takes longer

[6] Contactless payment technology has the potential to fundamentally change these cost structures, making debit cards cheaper for ever smaller amounts.

FIGURE 1 The efficiency threshold for different splitting ratios between value-related and volume-related costs.



as the amount of cash to be counted increases. Hence, this activity would have to be considered as value-related. Splitting up nonfixed costs exactly into volume- and value-related parts is virtually hopeless. Interestingly, this problem has received little attention in the literature. Researchers tend to proceed with their cost allocations without much further discussion. This is unfortunate because efficiency thresholds constitute important information for policy-making and should be based upon robust analysis.

More robustness can be attained by applying an alternative methodology that focuses on the interrelationship between value-related and volume-related costs (see Abele and Schaefer 2015). As argued above, the identification of fixed costs is usually less controversial. If this holds true, it is straightforward to derive the total amount of nonfixed costs as the difference between total costs and fixed costs. Next, it should be observed that increasing the share of volume-related costs directly implies a one-to-one reduction in value-related costs. In other words, as the value of the intercept of the cost schedule for one additional transaction rises, the slope of the graph decreases and (vice versa). This means, however, that changes in the share of volume- and value-related costs tend to have offsetting effects on the cost schedule. Hence, the intersection point with the flat cost schedule for debit cards tends to move relatively little for a broad range of typical allocation ratios. This result is shown in Figure 1.

TABLE 5 Card usage for point-of-sale (POS) and ATM transactions in Austria (2013).

Percentage of cards used for withdrawing cash from ATM	Percentage of cards used for POS debit transactions					
	Never	1–12 times per year	1–4 times per month	1–3 times per week	>3 times per week	Total
Never	25	6	3	1	0	35
1–12 times/year	4	7	9	7	1	28
1–4 times/month	2	4	8	11	4	28
Several times/week	0	1	2	4	2	9
Total	31	16	22	23	8	100

Source: Payment Services Austria and authors' own calculations.

In Figure 1 the solid black line is the cost schedule for an additional debit card transaction. The other schedules show the cost of an additional cash transaction depending upon the transaction value and the assumed splitting ratio, where ratios vary between 60% value-related nonfixed costs and 40% value-related nonfixed costs.[7] We can see that all lines intersect with the cost schedule for the debit card transaction at a value somewhat above €10. Hence, without having to commit ourselves to some specific splitting ratio, it is safe to say that the efficiency threshold as derived from the analysis lies within that range.[8]

4.2 Cost-efficient substitution of cash versus actual payment behavior

Our analysis of efficiency thresholds in the preceding section provides important insights into the design of a cost-efficient payment system. However, it indicates the maximum potential for cost-efficient substitution of cash at best. The actual potential for substitution is considerably smaller, as it is constrained by payment behavior and incentive structures.

Due to the specific institutional setup of the Austrian payment system, a novel data set could be made available, providing an interesting perspective on the actual potential for cash substitution. As the nonbank ATM network (Bankomat) and the backbone of the Maestro debit card system are managed by the same company (Payment Services Austria), individual data on card usage from a cardholder's perspective

[7] A rudimentary breakdown of available cost data into value-related and volume-related parts suggested that the true splitting ratio should lie within the range considered.

[8] The introduction of contactless payment technology has the potential to substantially reduce the cost of payment cards further. However, in 2013 contactless payments had just been introduced and were negligible in relation to total payment volumes.

TABLE 6 Preferences about cash versus card usage in Austria, 2014.

I pay…	%
Always with cash	29
Preferably with cash, sometimes with cards	23
With both cash and cards as I like them equally	23
Preferably with cards, sometimes with cash	16
Always with cards	10

Source: GfK Austria and authors' own calculations. Basis: 1000 adult Austrian consumers.

was available. Only ATM withdrawals at offices belonging to a cardholder's bank were not captured by the data. However, because consumers typically distinguish little between different types of ATMs, card usage patterns could be gleaned from the data set.[9] Some basic descriptive statistics from this data are reported in Table 5 to supplement the discussion of cost-efficient substitution.

A quarter of cardholders used their payment card for neither ATM nor point-of-sale (POS) transactions.[10] Hence, they only withdrew cash at their bank's office and made POS payments only in cash. These people are least likely to substitute cash for debit cards. Considering ATM transactions and POS debit transactions separately, 47% of cardholders used their card for POS transactions at best once a month. A total of 63% of cardholders used their debit card for ATM withdrawals (as defined above) at best once a month. Putting this evidence together, roughly speaking half of the adult population in Austria have a strong preference for cash and hence seem reluctant to substitute cards for cash under the status quo.

The results from data about actual card usage are backed up by survey data collected by a professional market research firm in 2014 (see GfK 2015). One thousand Austrian adults were interviewed about their personal preferences for making payments (see Table 6).[11] 52% indicated that they always or preferably paid with cash. Hence, a staggering one-half of the Austrian adult population would either have to experience a fundamental shift in preferences or would have to be exposed to sufficiently strong incentive schemes to engage in more cash substitution.

[9] Payment Services Austria provided an anonymized random sample of all ATM and debit card transactions for the 50 000 cards upon which the analysis is based.

[10] In Austria, a private bank account is typically combined with a payment card having the Maestro debit function enabled, which can be used both for ATM transactions and POS debit card payments. Typically, one person holds one debit card.

[11] Note that in Table 5 only people having a bank account are included, whereas the survey data reported in Table 6 includes both those with and those without. The difference is not very big, however, as the share of the adult population without a bank account is relatively low, at about 3%.

TABLE 7 Transaction amounts and volumes of Maestro cards and cash.

	Total sales (€)		Transactions	
	Maestro	**Cash**	**Maestro**	**Cash**
€0–10	331 771 599	10 616 691 172	53 839 402	1 722 860 864
€10–30	2 537 827 171	17 976 275 791	131 036 031	928 171 886
€30–50	3 090 275 823	7 033 041 528	78 965 111	179 713 701
€50–100	5 477 270 297	4 929 543 267	80 292 514	72 263 263
€100–200	3 157 390 199	1 603 753 752	23 475 902	11 924 268
€200–400	2 080 320 480	1 021 911 815	7 617 344	3 741 853
>€400	1 953 049 512	1 513 613 372	3 062 064	2 373 100
Total	18 627 905 081	44 694 830 697	378 288 368	2 921 048 934

At the other end of the spectrum, about 10% of the population strongly prefer debit card payments over cash. About 40% of the adult population pay with cards frequently or at least occasionally. This group of people seems to be more open to further substitution of cash even with lower powered incentive schemes.

A more extensive analysis of cash substitution is beyond the scope of this paper. However, the empirical evidence provided suggests a lot of heterogeneity in payment habits. Sizeable groups of the Austrian population have a strong predilection for paying in cash, which may be at odds with more cost-efficient payment structures. Obviously, the analysis of the threshold for cost-efficient payments in Section 4.1 can provide only the starting point for designing a more cost-efficient payment system.

5 CONCLUSIONS

The results of this study suggest that the cost of cash and debit card payments to the Austrian economy is moderate despite the relatively high share of cash in total transactions (see Table 7. Both in terms of unit costs and in terms of costs as a percentage of GDP, the cost estimates for Austria tend to be fairly close to the most efficient countries in Europe, eg, the Netherlands and the Scandinavian countries. There are two possible reasons for this finding: either the high share of cash payments in a high-income country created strong pressure to trim costs, or the results are due to differences in cost frameworks and data collection.

The first explanation might be supported by the fact that significant institutional change in the Austrian payment system indeed happened in recent years. Upon the introduction of the euro as a new currency, cash operations were bundled together under a newly created company owned by the Austrian national bank and private financial institutions. Both banks and large retail companies outsourced key cash

operations to this company, including, for example, the counting, transporting, safe storage and servicing of cash. Likewise, ATMs are centrally managed by another company owned by banks. The Maestro debit card network has also undergone fundamental institutional change, with large-scale international outsourcing of key back-office functions. Hence, centralization and outsourcing in an otherwise competitive banking environment has potentially enhanced cost efficiency. As a general conclusion, the institutional setup of the payment system may crucially shape costs, and not just the share of cash transactions.

The cost methodology used in this paper differs from that applied by the European Central Bank, for example. Hence, results may not be directly comparable. A closer examination of individual cost items sheds more light on the reliability of the data. With respect to indirectly obtained data about the back-office cost of companies, differences in methodology are less of a concern because average European ratios were used, and thus no artificial cost advantage was created for Austria. The observed duration of payment processes at the point of sale was based upon a larger sample of observations than in many other countries, and yielded similar results such that the most important item for the front-office costs of companies was based upon similar assumptions. As far as centralized cash and debit card operations were concerned, costs could be clearly identified, as they were incurred in specialized companies providing regular, publicly available financial reports that were supplemented by information directly obtained from the companies. As for information provided by private banking institutions, there was certainly a greater potential for data errors due to the complexity of banking operations and the well-known difficulty of separating costs related to a certain payment instrument from other costs. Still, there was probably little incentive for banks to underreport the cost of cash, which by far dominates the cost estimates, as in general banks tend to favor lower-cost digital payment instruments. Therefore, even though it would be very interesting to apply the methodology used by the European Central Bank to the Austrian payment system, there is some reason to believe that the analysis conducted in this paper should provide a fair approximation of the cost of cash and debit cards in the Austrian payment system.

In line with other research, this study finds that there is potential for further cost savings in Austria if medium and higher value payments get shifted from cash to debit cards (or potentially to other, newly emerging, digital payment instruments). The efficiency threshold above which debit card payments are cheaper was found to be somewhat above €10. A look at the empirical evidence about payment behavior suggests, however, that it may prove to be a tough challenge to realize this potential, as a strong predilection for cash is firmly entrenched in the Austrian population. Either fundamental shifts in preferences would have to occur, or sufficiently strong incentive schemes would have to be created to induce more cash substitution.

The cost efficiency of institutional structures may therefore continue to matter in Austria for several years to come. A suitable discussion of a cashless society, its design or policies to achieve such a goal (see Nyberg 2011; Thiele 2015) is in any case beyond the scope of this paper.

DECLARATION OF INTEREST

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